DETAILED ACTION

1. This Office Action is a response to the remarks filed July 28, 2008. Claims 1, 9, 25, 26, 33, 56, 77, 96, and 97 have been amended; claims 2-8, 11-24, 27-32, 35-50, 52, 54, 55, 57-73, and 78-95 were canceled without prejudice; no claims have been added.

2. In view of the amendment(s) and remarks, the rejections of claims 1, 9, 10, 25, 26, 33, 34, 96 and 97 under 35 U.S.C. §102(b) as being anticipated by Miwa (JP 2002-260441) and Miwa (JP 2003-045226) independently; the rejections of claims 1, 9, 10, 25, 26, 33, 34, 96 and 97 under 35 U.S.C §102(b) as being anticipated by Khan et al. ("ABA triblock comb copolymers with oligo(oxyethylene)side chains as matrix for ion transport", Makromol. Chem., 190, 1069-1078 (1988)), and the rejection of claims 56 and 77 under 35 U.S.C. §103(a) as being unpatentable as obvious over Khan et al. in view of Giles et al. (U. S. Patent 5,196,484) have been withdrawn.

3. Claims 1, 9, 10, 25, 26, 33, 34, 51, 53, 56, 74-77, 96, and 97 are now pending.

EXAMINER'S AMENDMENT

4. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Louis J. DelJudice (Reg. No. 47,522) on December 4, 2008.

5. Claims 51, 53, and 74-76 have been cancelled.

Allowable Subject Matter

6. Claims 1, 9, 10, 25, 26, 33, 34, 56, 77, 96, and 97 are allowed.

7. The following is examiner's statement of reasons for allowance:

The present claims are allowable over the closest references: Miwa (JP 2002-260441 and JP 2003-045226); Khan et al. ("ABA triblock comb copolymers with oligo(oxyethylene)side chains as matrix for ion transport", Makromol. Chem., 190, 1069-1078 (1988)), and of Giles et al. (U. S. Patent 5,196,484).

With regard to the limitations of claims 1, 9, 10, 25, 26, 33, 34, 96 and 97, Miwa'441 discloses that a polymeric solid electrolyte contains a polymeric compound composed of a ring-opening polymer of an acrylate backbone-having oxetane compound of general formula (1), wherein a is 10-400, m1 is each independently 1-6, n1 is each independently $1 \leq n1 \leq 20$, and R_1, R_2 is each independently an alkyl group which may be branched containing 1-12 carbon atoms or hydrogen atom, and electrolytic salt (abstract).

With regard to the limitations of claims 1, 9, 10, 25, 26, 33, 34, 96 and 97, Miwa'226 discloses that a polymeric solid electrolyte contains a polymeric compound composed of a ring-opening polymer of oxetane compound having an acrylate skeleton as expressed by formula (1) (wherein a and b are each independently10-600, ml and m2 are each independently 1-6, n1 and n2 are each independently $1 \leq n1 \leq 20$, and R_1 and R_2 expresses an alkyl group having containing 1-12 carbon atoms that may be branched each individually, or hydrogen atom. R_3 and R_4 are an alkyl group having

containing 1-12 carbon atoms that may be branched each individually), a nonaqueous solvent, and an electrolytic salt (abstract).

With regard to the limitations of claims 1, 9, 10, 25, 26, 33, 34, 96 and 97, Khan discloses ABA triblock copolymer consisting of two terminal blocks (A) of comb-like polymethacrylate with oligo(oxyethylene) side chains (on average eight oxyethylene units per side chain) and a middle block B of polystyrene, which were synthesized by anionic polymerization. The ratios A/B were varied. The polymers were then solution-cast from tetrahydrofuran solutions of lithium perchlorate, and the homogeneous, solvent-free polymer electrolyte systems tested for their thermal characteristics (DSC) and conductivity. The inclusion of a polystyrene block in the comb-like polymethacrylate electrolyte vastly improves their film-forming and mechanical properties, but also lowers the conductivity. Addition of dimethytetraethyleneglycol (2,5,8,11,14-pentaoxapentadecane) enhances the ion conduction, which can reach values of 10^{-4} Ω^{-1} cm^{-1} at 70°C, depending on salt and styrene content (abstract).

With regard to the limitations of claims 56 and 77, Giles et al. discloses ABA triblock polymers, the A block being rigid having a transition away from its rigid phase above 70°C, the B block being wholly or partly ion- coordinating, elastomeric or amorphous, the B/A block length ratio being greater than 1. When the B block is complexed with an ionic salt these polymers act as polymeric electrolytes, which may be used in cells etc. Preferred polymers are those where HC=CH sites in the polybutadiene segment of a polystyrene-polybutadiene-polystyrene polymer are

replaced by $–CH_2CH–X–(CH_2CH_2O)_m–R$, where X is link, R is alkyl. A preferred salt is $LiCF_3SO_3$ (abstract).

Giles discloses that the B-blocks are ion-coordinating, and the atom in the B-block responsible for ion-coordination is oxygen in an oxyalkane sequence containing 2 to 6 carbon atoms between neighboring oxygen atoms. Preferably, the oxyalkane sequence is a polyoxyethylene sequence, i.e.: $-(CH_2-CH_2-O-)_m-$ where m is an integer. The ion-coordinating B-block is elastomeric or amorphous. It is therefore desirable to have only short oxyalkane sequences so as to reduce the amount of ambient temperature crystallization. Alternatively, when m is rather high, B-block plasticizers may be mixed with or blended with the polymer, for example low mass (less than ca 800) polyethylene glycol dimethyl ether (col. 4, line 66 through col. 5, line 15).

However, Miwa, Khan and Giles do not disclose or fairly suggests that R_9 represents an organic group having at least one functional group selected from the group consisting of hydroxyl group, carboxyl group, three-membered-ring epoxy group, acid anhydride group and amino group as per newly amended claims 1, 25 and 77.

8. As of the date of this Notice of Allowability, the Examiner has not located or identified any reference that can be used singularly or in combination with another references including Miwa, Khan and Giles to render the present invention anticipated or obvious to one of ordinary skill in the art.

9. In the light of the above discussion, it is evident as to why the present claims are patentable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delay, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reason for Allowance".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL M. BERNSHTEYN whose telephone number is (571)272-2411. The examiner can normally be reached on M-Th 8-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on 571-272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael M. Bernshteyn/

Examiner, Art Unit 1796

/M. M. B./
Examiner, Art Unit 1796

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Supervisory Patent Examiner, Art Unit 1796